Southern Wisconsin Forest Health Update

Wisconsin DNR, Forest Health Protection Unit
June 16th, 2016 Vol. 13 No. 2

Topics in this update

Articles in this newsletter were written by Mark Guthmiller, Regional Forest Health Specialist, unless otherwise noted.

Frost Damage

A couple May frost events caused moderate to severe damage to the first flush of leaves on white oaks and red oaks in and around Mirror Lake State Park in northern Sauk County. In this area trees in mid to upper elevation areas were most susceptible to damage at the time of the frost events. Approximately 260 acres were impacted in this area. The trees that were hit hard enough should put out a new set of foliage. This will put an added stress on the trees and could set them up for attack by secondary pests. Fortunately, we are not in a severe drought and the trees should be able to cope with the frost damage.

Moderate to severe frost damage hit white and red oaks in northern Sauk County in May

Additional reports of frost damage have come in around the state including areas in Chippewa, Dunn, Eau Claire, and Monroe Counties.

Emerald Ash Borer– Bill McNee

Now that ash leaf-out is complete, the canopy thinning of EAB-infested trees can be seen across large parts of southern Wisconsin. If you see this canopy thinning with smaller, pale leaves, visit Wisconsin's Emerald Ash Borer website to see if the pest has not yet been detected in that community or county. There are additional symptoms one can look for as well such as woodpecker activity, D – shaped exit holes in bark, and S- shaped winding galleries just under the bark. Suspected new infestations can be reported to Mark Guthmiller or Bill McNee using the contact information at the end of this pest update.

EAB-infested ash in Delavan showing canopy thinning, with small and pale leaves. Photo by Bill McNee.

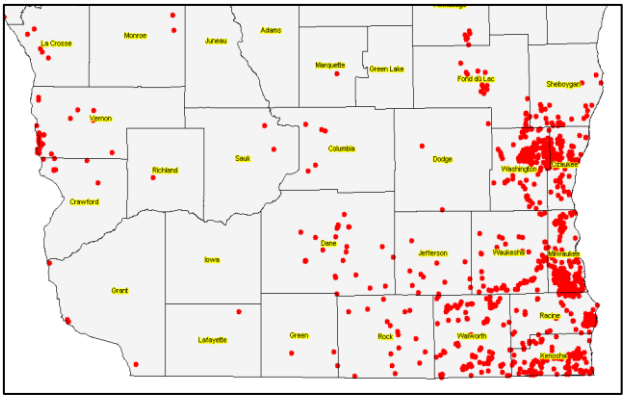
New Village or City EAB detections in the Southern District since the last pest update:

- Milwaukee Co. – Glendale
- Racine Co. – Wind Point
- Rock Co. – Evansville
- Sauk Co. – Baraboo
- Vernon Co. – Readstown
- Waukesha Co. – Butler, Dousman, Pewaukee

Other recent detections to mention:

- Wisconsin Rapids, Wisconsin
- Harrison County, Texas – first detection in that state
- Omaha, Nebraska – first detection in that state

A complete list of Wisconsin's municipal EAB detections can be found on the state EAB website.



Emerald ash borer detections in southern Wisconsin as of June 2016.

Treatments

Insecticide treatments would usually have been completed by now, but if you are still considering them, a summer treatment may still be effective at killing the smaller larvae before they create large feeding galleries. Consult the product labels. EAB adults are now emerging in most of Wisconsin. The adult EAB will be found hovering near ash trees or crawling on their bark. Beetles that crawl on the ground are likely not EAB, and are often a native insect known as a 'Tiger Beetle.'

EAB adult. Photo by Bill McNee.

EAB Biological Controls:

This summer, DNR staff will continue to do introductions of the natural enemy wasps, *Tetrastichus planipennisi* and *Oobius agrili*, in southern Wisconsin. The *Tetrastichus* wasps attack EAB larvae beneath the bark, and the *Oobius* wasps attack EAB eggs on the bark surface. The tiny wasps do not sting or bite, and the public is unlikely to know they are present.

These introductions are being done to help delay tree mortality and to help ash trees fight off EAB in the future by lowering EAB population levels. Several thousand wasps are released at each of the sites. The wasps have previously been released at 12 sites in southern Wisconsin, and will be released at another nine this summer. First releases will also be done in northeast Wisconsin.

Tetrastichus planipennisi, the larval parasitoid, was successfully recovered by DNR staff at three sites in Kenosha, Racine and Walworth Counties last month. (Species identification is based on photos submitted to USDA experts). These recoveries indicate that the wasps released in 2013 successfully established and have been attacking EAB larvae since then. In 2013, UW-Madison researchers also recovered this species at a 2011 release site in Ozaukee County. Tree bark samples are currently being incubated to see if any *O. agrili* emerge from parasitized EAB eggs. Recovery surveys will continue to be done at many locations 2-3 years after wasps are released at a site.

Dead *T. planipennisi* wasps found inside an EAB gallery in Walworth County, May 2016. This species attacks EAB larvae beneath the bark. Photo by Bill McNee.

Gypsy Moth– Bill McNee

As of mid-June, large gypsy moth larvae (1.5” in length) are predicted to be present as far north as the Hayward area. DNR staff have received reports of abundant caterpillars at scattered locations in Columbia, Dane, Juneau, Rock, Sauk, Walworth, Washington and Waukesha Counties. So far we have not had any reports of defoliation heavier than ‘shot hole’ nibbling on leaves. Wisconsin’s largest infestation reports to date have been in the area of southern Wisconsin shown in yellow and light green on the map below, where precipitation has been below average in the last month.

Mature gypsy moth caterpillar. Photo by Mark Guthmiller.

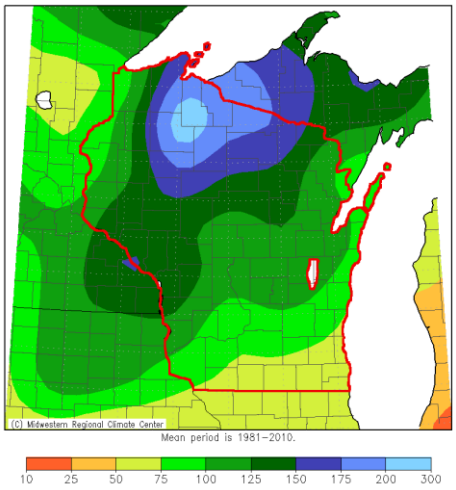
Caterpillar Diseases

The recent weather has been a little drier than average with spotty areas of rain, but we have had a couple reports of caterpillar mortality from the *Entomophaga* fungus and the NPV virus. The incidence of disease was relatively low though at this time. The reports came from southern Dane County and northern Sauk/Juneau County. Please contact Mark Guthmiller or Bill McNee if you see numerous dead caterpillars on trees, as shown in the photo.

Gypsy moth caterpillars killed by the Entomophaga fungus (vertical larvae) and NPV virus (inverted ‘V’ larvae). Photo by Bill McNee, taken in 2004.

Predicting Next Year’s Population

Predicting next year’s populations levels can be started in mid-August once all of the egg masses have been produced and adult moths have finished their life cycle. For more information about control methods and predicting next year’s population levels, visit Wisconsin's Gypsy Moth website.



Percent of mean precipitation in the 30 days ending June 13, 2016. Map by the Wisconsin Regional Climate Center, with state outline added.

Brooms, Brooms, and more Brooms

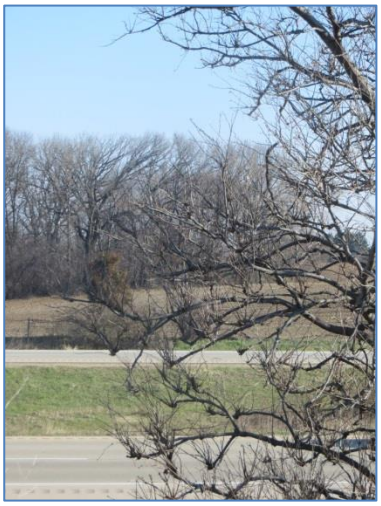
This past winter and early spring, before trees had full leaf expansion, was a great time to observe "brooms" in a variety of tree species around southern Wisconsin. A number of things have been implicated in causing brooms, which are basically a dense growth proliferation of branches, including virus's, rust fungi, eriophid mites, powdery mildew, combination of mites and powdery mildew, dwarf mistletoe, road salt, phytoplasmas and likely other causes. This summer we will prioritize and plan to test a subset of trees for phytoplasma. Since there are other causes of brooms besides phytoplasma, we will also evaluate for other common symptoms that might be present when deciding to test for phytoplasma. Some of these symptoms include extensive epicormic (sucker) sprouts, basal and trunk cracking, stunted foliage, chlorotic foliage, and/or loss of apical dominance (stunted branch growth appearance). Some of the species observed with brooms included elm, birch, basswood, mulberry, willow, and buckthorn. I would be interested in observations of such brooms, especially if associated with tree health impacts. Here is a sampling of recent pictures of trees observed with brooms that we will evaluate further. Watch for test results later this year.

Elm, *Ulmus* spp. in Richland County

Elm, *Ulmus* spp. in Iowa County

Mulberry, *Morus* spp. in Richland County

Willow, *Salix* spp. in Dodge County

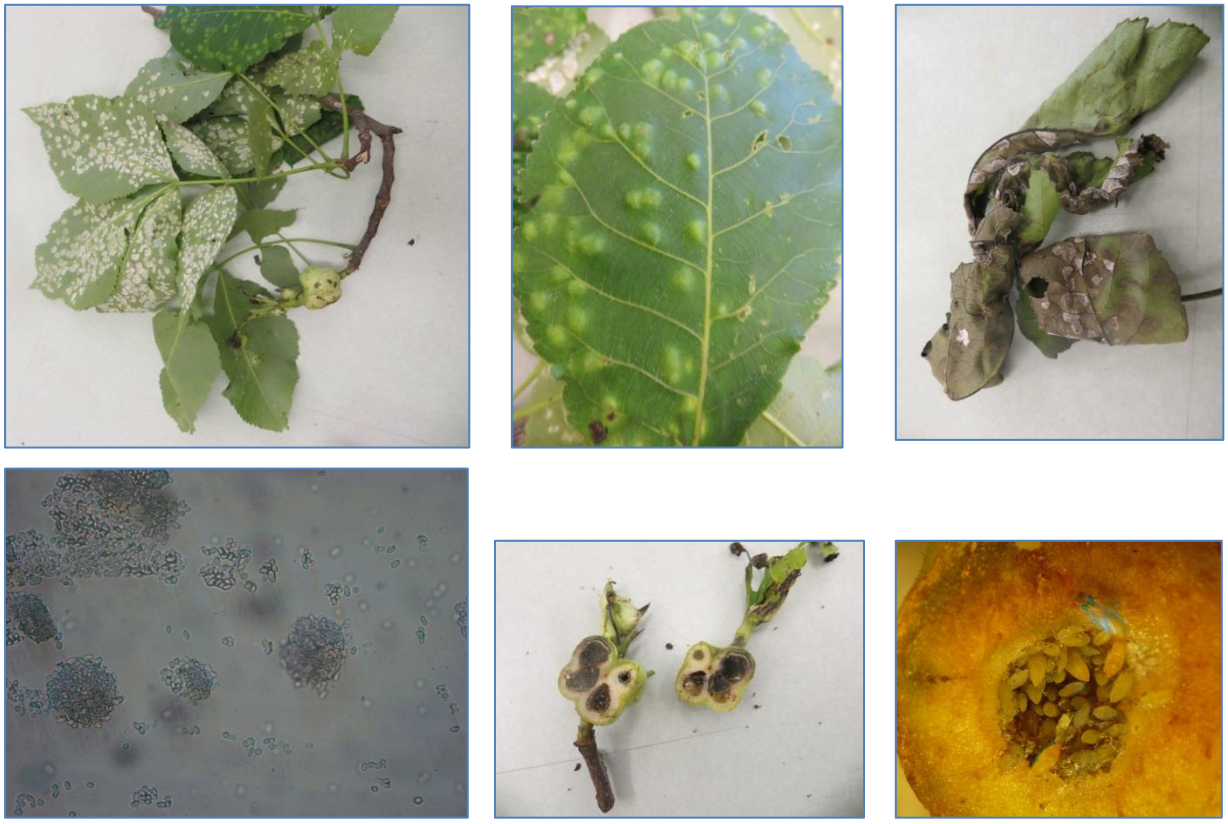


Brooms caused by suspect salt injury to basswood, *Tilia* spp. in Jefferson County

Buckthorn, *Rhamnus cathartica* in Dane County

Shagbark Hickory White Mold and Phylloxera

A single shagbark hickory tree, *Carya ovata*, was observed in Dane County with the lower third of the canopy showing an extensive white mold on the undersides of leaves. The top surface associated with the white mold had raised chlorotic bumps. Some leaves had started to curl, brown up, and fall from the tree but this was minor so far. A sample was submitted to the DNR forest pest lab for further evaluation. It looks very similar to Microstroma leaf spot in the reference book, which has also been associated with the development of witches' brooms in certain species of hickory and walnut. We have recently reported on shagbark hickory with witches' brooms confirmed with phytoplasma in outer branch broom material from another site. This particular tree was not exhibiting any brooms at this time so will warrant monitoring. This tree did however, have numerous galls caused by aphid-like sucking insects known as phylloxerans. It is unknown if these phylloxerans have any relationship to the white mold, subsequent broom formation, or possible introduction of phytoplasma. I would be interested in reports of any observations of this white mold on the underside of leaves of shagbark hickory or observations of brooms in this species.



Top left, clockwise: Shagbark hickory branch with underside of leaves exhibiting a white mold and branches with phylloxeran galls; upper surface of hickory leaflet showing raised pale bumps associated with the white mold; browning up leaf impacted with white mold; microscopic structures, possibly conidiophores with conidia of *Microstroma juglandis* or similar white mold; Phylloxeran galls cut open; close –up of the phylloxerans inside the gall.

Hawthorne Rust

This has been a great year for the rust fungi. What appears to be Hawthorne rust (Cedar –apple rust, quince rust and others are very similar and could also be involved in some areas) was widely observed in southern Wisconsin this spring, from southern Rock County over to Grant County. This group of rusts fungi would be in the genus *Gymnosporangium*. In my observations, the rust has been noticed mainly between eastern red cedar, *Juniperus virginiana*, and the alternate host hawthorn, *Crataegus spp*. There are many tree species in the *Rosaceae* family that are alternate hosts to junipers as well. With the eastern red cedar, small galls with extensive orange jello-like "telial horns" were commonly observed and appear typical of hawthorn rust. One eastern red cedar tree had both small balls with telial horns and orange jello-like ooze coming out of swollen branches. The swollen branches looked more indicative of quince rust but not certain if this might actually be two different species of *Gymnosorangium* impacting this juniper. Hawthorn developed yellow spots all over the leaves, indicative of the rust fungus. If severe enough, a hawthorn tree may drop the leaves early in the season. Some impacts to fruits and small branches can also occur, especially with quince rust. Follow IPM (integrated pest management) to deal with this disease. Avoid planting these two groups of plants close together, when possible select rust resistant species/cultivars when planting, remove and destroy symptomatic branches if a light infection, tolerate some level of disease, remove and replace highly problematic trees, and consider properly timed fungicide treatments for high valued trees following label directions.

Top to bottom: Telial "horns" typical of hawthorn rust; swollen branches with telia oozing out appears more like quince rust; yellow spots on hawthorn indicative of hawthorn rust.

Hemlock Woolly Adelgid (HWA) – Bill McNee

If you work around hemlock trees, keep an eye out for the adelgid, which produces distinctive, small balls of white wool at the base of needles.

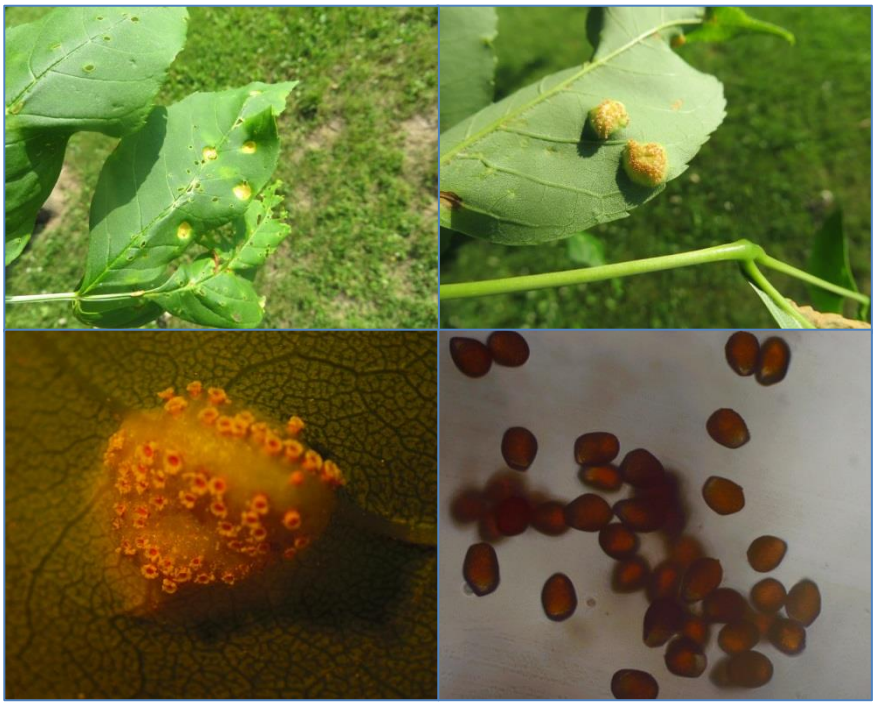
Hemlock woolly adelgid has not been found in Wisconsin. If you see this on a hemlock tree, it is important to report it to DNR forest health staff. More information about HWA can be found here: http://dnr.wi.gov/topic/ForestHealth/Adelgid.html.

White balls of hemlock woolly adelgid wool on a hemlock twig in Maryland. Photo by Bill McNee, WI DNR.

Cordgrass and the Ash Tree – a Rust Story

While investigating some trees on our DNR grounds, our new forest health lab assistant Colton Meinecke, pointed out some leaves with what turned out to have ash leaf rust, *Puccinia sparganioides*. The top sides of the leaves had sunken depressions and the associated bottom side of the leaves had orange suction cup structures common to this rust fungus. Reading a little about the biology of this rust it turns out the alternate hosts are a couple species of grasses, including marsh grass, *Distichlis spicata* and cordgrass, *Spartina* spp. This prompted a quick look at our rain garden planted next to the building and close to the ash tree. Indeed there was a grass species in one of the rain gardens that was possibly cordgrass but with no seed heads for identification. When examining some of these plants a number of plant bugs were observed "frolicking" in the sheath area of the grass. The plant bugs were collected and do appear to be the "little Spartina bug, *Ischnodemus falicus*, which is associated with cordgrass. So indeed, we likely have the alternate host *Spartina* spp. adjacent to that ash tree! Apparently, this rust cycles every 5-7 years. Any bet's whether that ash tree will be there in 5-7 years?

Suspected alternate host, cordgrass (*Spartina* spp.) in foreground and the ash tree with leaf rust in the background.



Top left clockwise of Ash leaf rust, *Puccinia sparganioides*: upper leaf surface with light colored depressions; bottom of leaf showing aecia; close-up of aecial cups; aeciospores.

What appears to be Spartina bug, *Ischnodemus falicus*, helped identify the grass as likely a cordgrass, *Spartina* spp.

Miscellaneous Topics and Observations

Introducing Colton Meinecke, DNR Forest Health Lab Assistant
Colton Meinecke is the new Forest Health Lab Assistant and began work on June 13th. Here is a short bio he shared with us:

I am a recent graduate of the microbiology program at UW Madison. During my last two years at the university I worked in the Department of Plant Pathology where I discovered my interest in plant-microbe interactions. Here I assisted in graduate research on the bacterial diversity of agricultural field soils.

I grew up in the village of Deerfield and consider rural Wisconsin to be home. I like to have projects and keep myself busy with gardening, brewing, and woodworking. In my downtime I like to read Russian literature and listen to classic rock.

Now that I have graduated I am looking forward to building on my skills and applying what I have learned as a member of the Forest Health team.

We are excited to welcome Colton to the Forest Health Team!

Black Cherry Finger Gall Mite
I observed a few black cherry trees in Dane and Sauk County with leaves inundated with galls caused by Eriophyid mites (*Eriophyses* sp.). The mites feed on these leaves, which causes a spindle or finger like gall to form on the upper leaf surface, which the mites later use for egg laying and further development in there complex lifecycle. The galls are mainly cosmetic.

Cryptoporus volvatus
While investigating a pine plantation for Heterobasidion root disease (HRD) in Columbia County, I came across this cool little fungus. I have mentioned this fungus in a past writing and thought is looked like cashews stuck on a tree. Actually, I think it looks more like foam insulation blobs sticking out of the trunk. It is a saprobe that shows up early on dead standing or cut pines. It is actually a polypore but the pore layer is hidden on the underside, as the genus name implies, with an extension of the fruiting body cap. One would have to look close and likely would not confuse this with the conk of HRD.

Left: Underside of fruiting body of Cryptoporus volvatus showing hidden pore layer; Right: Fruiting bodies on pine log that look like foam insulation globs.

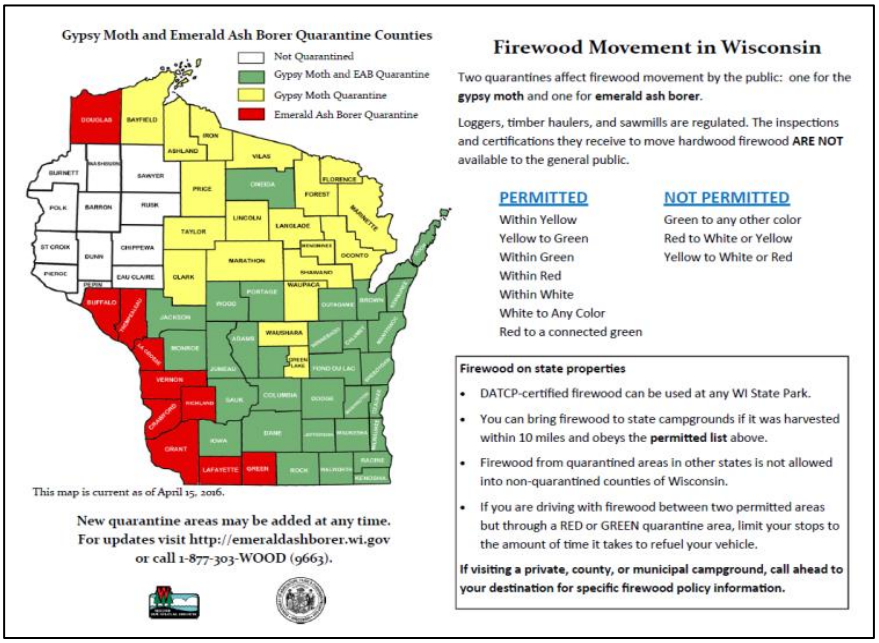
Unidentified Oak Gall

While monitoring for gypsy moth development and leaf phenology for this year's spray program, I came across this gall on a white oak high up in the canopy. I was able to zoom in and get this picture with what appeared to be possible cynipid wasps hovering around the gall and landing on leaves. Oak apple gall is apparently primarily found on red and black oak so I don't think that was it. There however is mention of the common oak leaf gall caused by the wasp, *Cynips quercusfolii* that could be found on white oak, although this gall might be too big. Apparently the galls from this common leaf gall wasp were once used in the making of dye due to the tannins and referred to as "gallnuts or nutgalls".

Firewood Movement:

It is a good idea to use firewood locally and not transport it a long distance. The risk of pest spread is reduced if using seasoned wood that has loose bark. An easy-to-use map of allowed firewood movement can be found here: Firewood Movement in Wisconsin

Be aware that this map will change in response to future county detections and quarantines.



Map of allowed firewood movement in Wisconsin as June 2016. Note that this map changes frequently. Go to the web link above for most up-to-date map.

SOD Forest Health Assistance
Wisconsin DNR, Forest Health Protection Unit
June 2016

Contacts for DNR staff, municipal foresters, and forestry cooperators

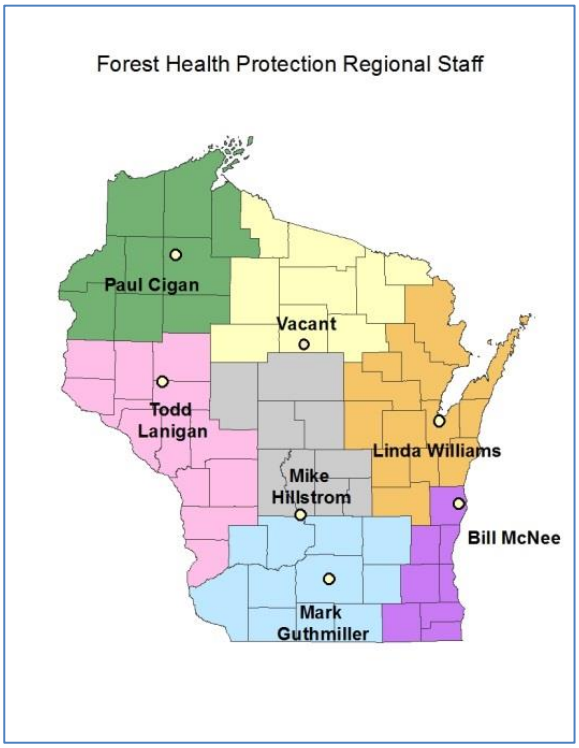
Mark Guthmiller Forest Health Specialist Wisconsin DNR 3911 Fish Hatchery Road Fitchburg, WI 53711 Phone: (608) 275-3223 Email: Mark.Guthmiller@wisconsin.gov **Columbia, Dane, Dodge, Grant, Green, Iowa, Jefferson, Lafayette, Richland, Rock, and Sauk**	Bill McNee Forest Health Specialist Wisconsin DNR 1155 Pilgrim Rd. Plymouth, WI 53073 Phone: 920-893-8543 Email: Bill.McNee@wisconsin.gov **Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington, and Waukesha**

For a statewide forest health staff list:
http://dnr.wi.gov/topic/ForestHealth/staff.html

Additional Program Web-based Resources:
WI DNR Forest Health web site:
http://dnr.wi.gov/topic/ForestHealth/

Report Emerald Ash Borer in Unconfirmed Counties:
by phone 1-800-462-2803
by email:
DATCPEmeraldAshBorer@wisconsin.gov
visit the website: http://emeraldashborer.wi.gov

Report Gypsy Moth:
by phone at 1-800-642-6684
by email: dnrfrgypsymoth@wisconsin.gov
visit the website: http://gypsymoth.wi.gov
(It is also recommended to report gypsy moth to your local government)



Please direct public inquiries regarding yard tree concerns to UW county or state extension offices: http://www.uwex.edu/ces/cty/

[Pesticide use: Pesticide recommendations contained in this newsletter are provided only as a guide. You, the applicator, are responsible for using pesticides according to the manufacturer's current label directions. Read and follow label directions and be aware of any state or local laws regarding pesticide use.]